FD-JL-PCB-MB

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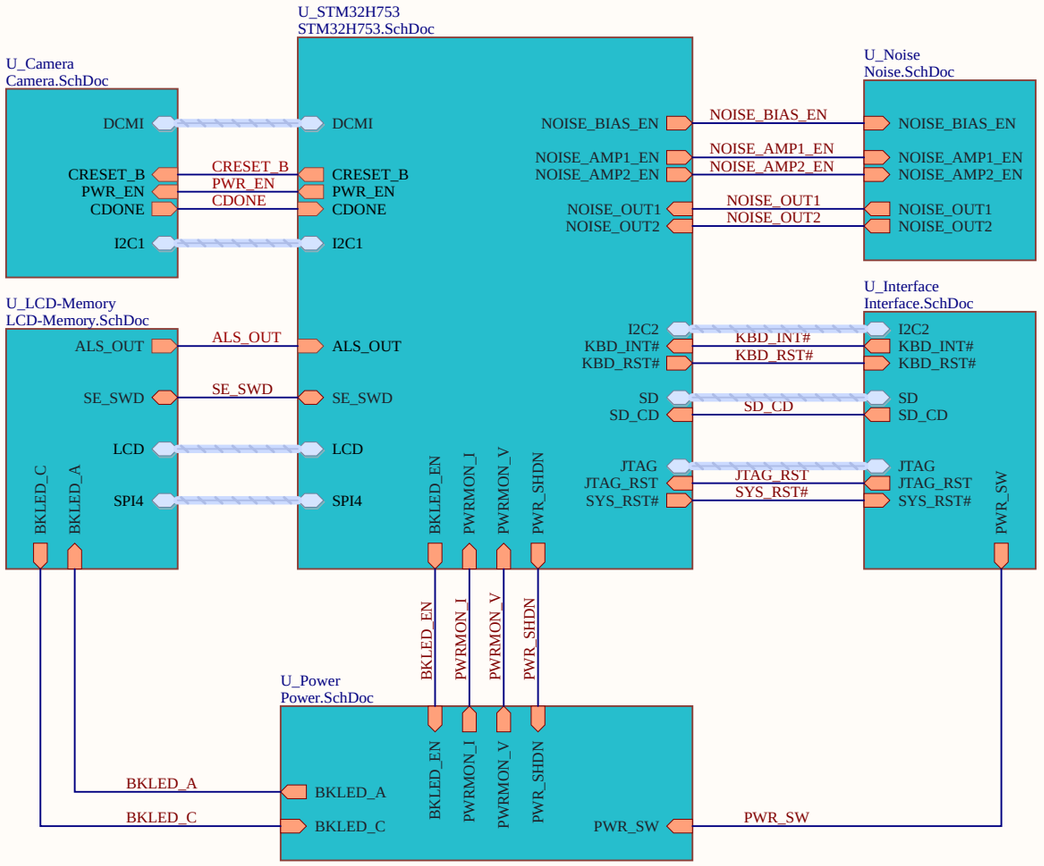
Revisions

Rev	Description	Date	Approved
C1	Release for Production	11/09/2020	M. Beach

STM32H753



CAMERA HEADER

LIGHT SENSOR

SECURE ELEMENT

LCD

AVALANCHE NOISE SOURCE

KEYPAD

SD CARD

JTAG

POWER / REGULATORS

PCB1 C1

PCB

FD-JL-PCB-MB

LICENCE: CERN-OHL-S v2

Engineer: M. Beach	FOUNDATION	Foundation Devices Inc 6 Liberty Sq #6018 Boston, MA 02109
Designer: M. Beach	Drawing Title: FD-JUL-MB.PrjPcb	
Approved: M. Beach Date: 11/09/2020	Page Title: Title.SchDoc	
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STM32H753

Board Revision

Design Note: Board Revision Ladder
Rev X1: 0V
Rev A5: 0.5V
Rev B4: 1.0V
Rev C1: 1.5V

Supply Supervisor

U3 TPS3840DL27DBVR

Design Note:
tD = 618937 * CCT_EXT + 50 µs
tD = 618937 * 1.5E-9F + 50us
tD = 0.978 ms

Fiducials

FID1 FID1X2R | FID2 FID1X2R | FID3 FID1X2R
FID4 FID1X2R | FID5 FID1X2R | FID6 FID1X2R

Mounting Holes

ST1 TH-D2_45 | ST2 TH-D2_45

Decap

C5 100nF | C6 100nF | C7 100nF | C8 100nF | C9 100nF | C10 100nF | C11 100nF | C12 100nF

Design Note:
Stabalization for main regulator

C13 2.2uF | C58 2.2uF

U2 STM32H753VIT6

VCC: VDD, VDD, VDD, VDD, VDD, VDDA, VREF+, VBAT
Reset: RST
Boot Mode: BOOT0
JTAG: PB3 (JTDO/TRACESWO), PA13 (JTMS-SWDIO), PA14 (JTCK- SWCLK), PB4 (NJTRST)
OSC: PC14-OSC32 IN, PC15-OSC32 OUT, PH0-OSC IN, PH1-OSC OUT
USB: PA9/OTG_FS_VBUS, PA11/OTG_FS_DM, PA12/OTG_FS_DP, PA10/OTG_FS_ID
SDMMC: PC8/SDMMC1_ D0, PC9/SDMMC1_ D1, PC10/SDMMC1_ D2, PC11/SDMMC1_ D3, PC12/SDMMC1_ CK, PD2/SDMMC1_ CMD
VSS: VSSA, VSS, VSS, VSS, VSS, VSS
MISC: PB2/RTC_OUT, PC13, PD0/UART4_RX, PD1/UART4_TX, PD4, PD5, PD6, PD7, PD8/USART3_TX, PD9/USART3_ RX, PD10, PD14, PD15, PE2, PE3, PE7, PE8, PE9, PE10, PE15
TIMx: PA8/TIM1_CH1, PB0/TIM8_CH2N, PB1/TIM3_CH4, PB8/TIM4_CH3
ADC: PC0/ADC123_INP10, PC1/ADC123_INP11, PC2_C/ADC3_INP0, PC3_C/ADC3_INP1, PC4/ADC12_INP4, PC5/ADC12_INP8
USART: PA0/UART4_TX/USART2_CTS, PA1/USART2_RTS, PA2/USART2_ TX, PA3/USART2_ RX
SPI: PA5/SPI1_SCK, PA7/SPI1_MOSI, PA15/SPI1_NSS (JTDI), PB13/SPI2_SCK, PB14/SPI2_MISO, PB15/SPI2_MOSI, PE11/SPI4_NSS, PE12/SPI4_SCK, PE13/SPI4_ MISO, PE14/SPI4_ MOSI
I2C: PB5/I2C1_SMBA, PB6/I2C1_SCL, PB9/I2C1_SDA, PB12/I2C2_SMBA, PB10/I2C2_SCL, PB11/I2C2_SDA, PD11/I2C4_SMBA, PD12/I2C4_SCL, PD13/I2C4_SDA
DCMI: PA4/DCMI_ HSYNC, PB7/DCMI_ VSYNC, PA6/DCMI_PIXCLK, PC6/DCMI_D0, PC7/DCMI_D1, PE0/DCMI_D2, PE1/DCMI_D3, PE4/DCMI_D4, PD3/DCMI_D5, PE5/DCMI_D6, PE6/DCMI_D7

PWR_SHDN, NOISE_AMP2_EN, NOISE_AMP1_EN, NOISE_BIAS_EN, LED1, LED2, MCU_KBD_RST#, SD_CD, DCMI_PWDN, PWR_EN, CDONE, CRESET_B, LCD_DISP, EXTCOMMIN, DCMI_XVCLK, BKLED_EN, NOISE_OUT2, NOISE_OUT1, ALS_OUT, BDREV_ADC, PWRMON_V, PWRMON_I, SE_SWD, MRESET_B_R, LCD_SCLK_R, LCD_SCS_R, SPI4_NSS, SPI4_SCK, SPI4_MISO, SPI4_MOSI, I2C1_SCL, I2C1_SDA, KBD_INT#, I2C2_SCL, I2C2_SDA, USER_BTN, HREF, VSYNC, PCLK, DCMI_D0, DCMI_D1, DCMI_D2, DCMI_D3, DCMI_D4, DCMI_D5, DCMI_D6, DCMI_D7

DCMI_Output: PWDN, DISP, EXTCOMMIN, XVCLK, LCD, CLK, MOSI, SCS, SPI, CS0, SCK, MISO, MOSI, I2C, SCL, SDA, Output, D[7..0]

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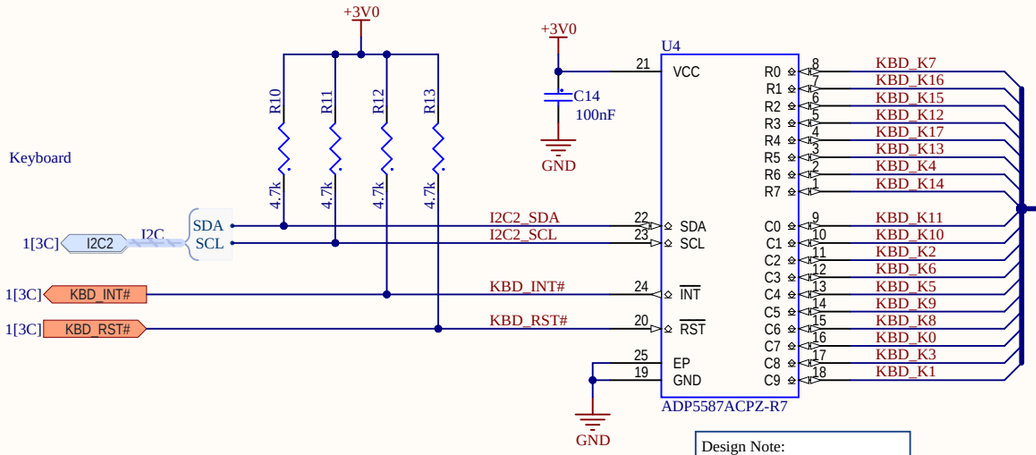
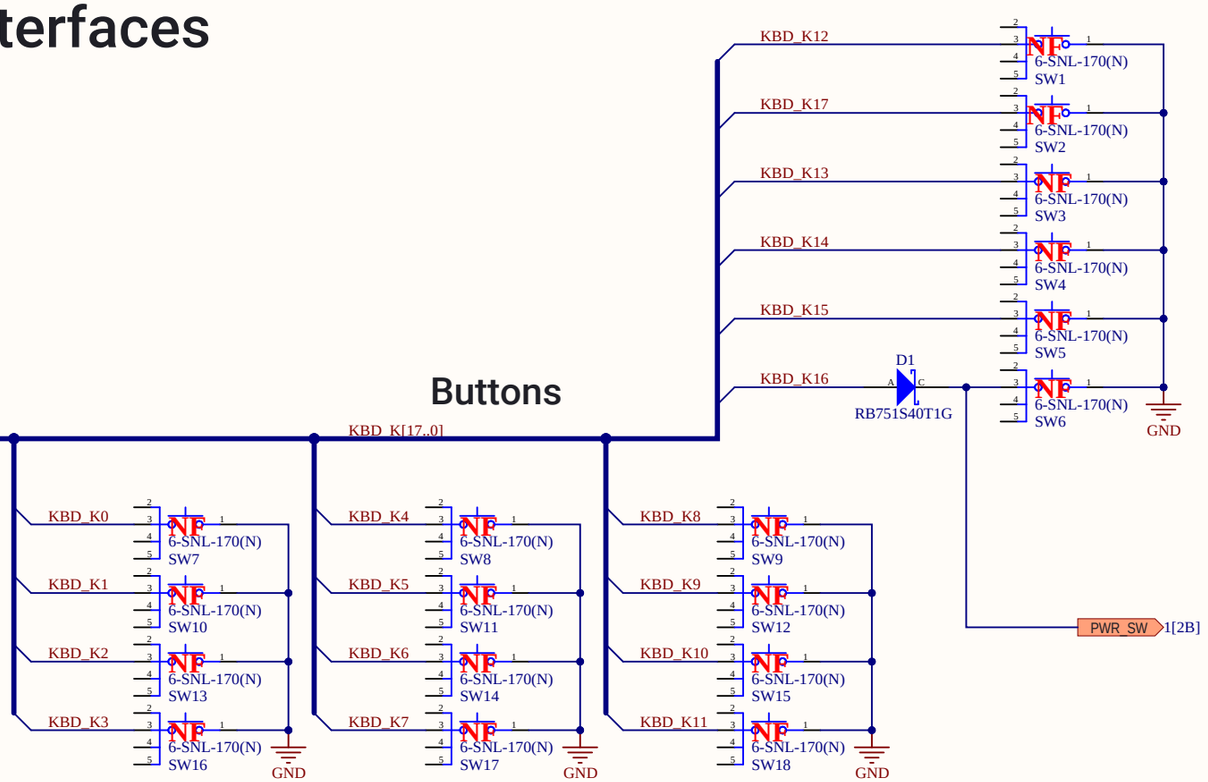
Interfaces

Keypad Controller

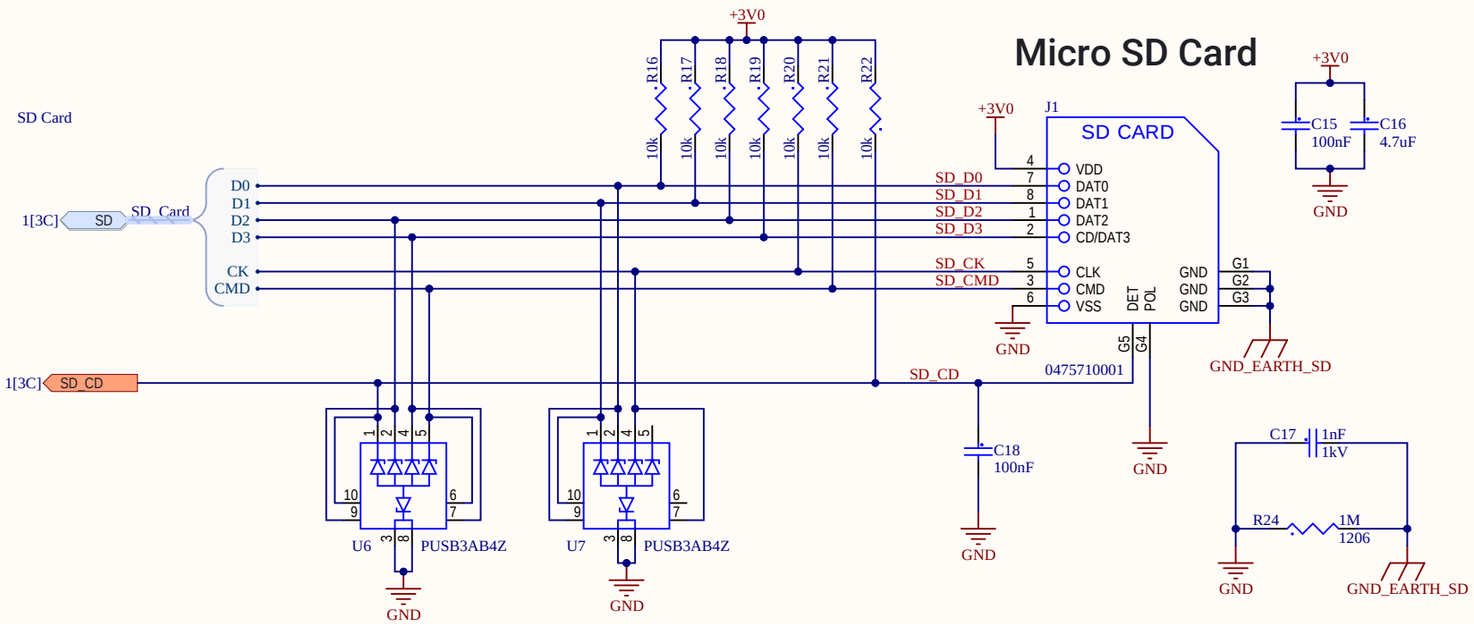


Design Note:
Keyboard controller has internal pullups and debouncing.

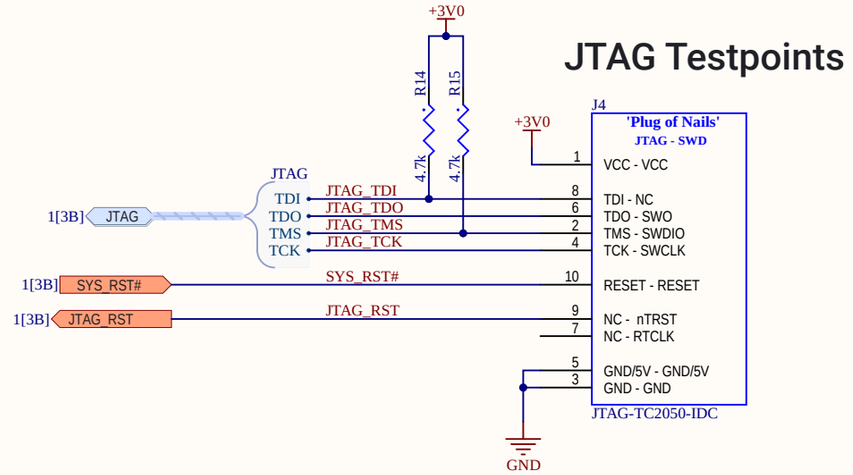
Buttons



Micro SD Card



JTAG Testpoints



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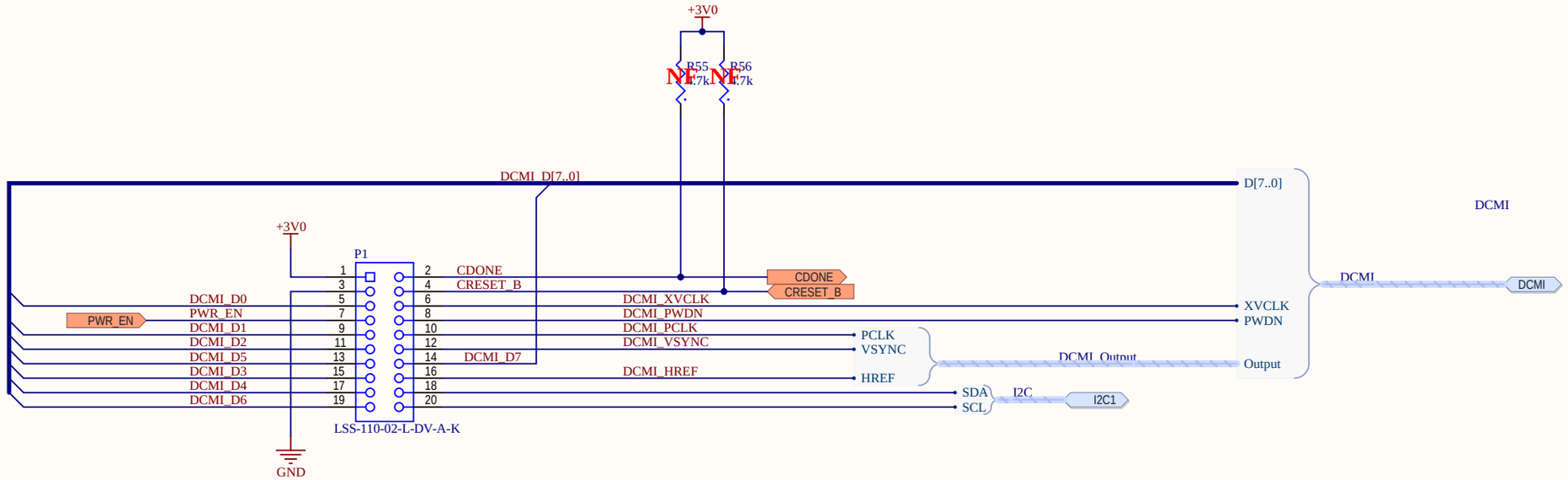
Camera Connector



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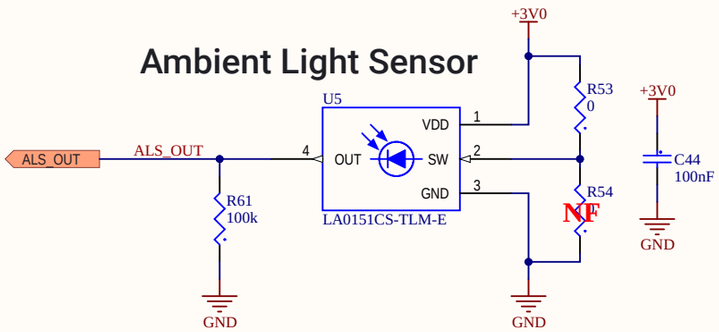
LCD, MEMORY

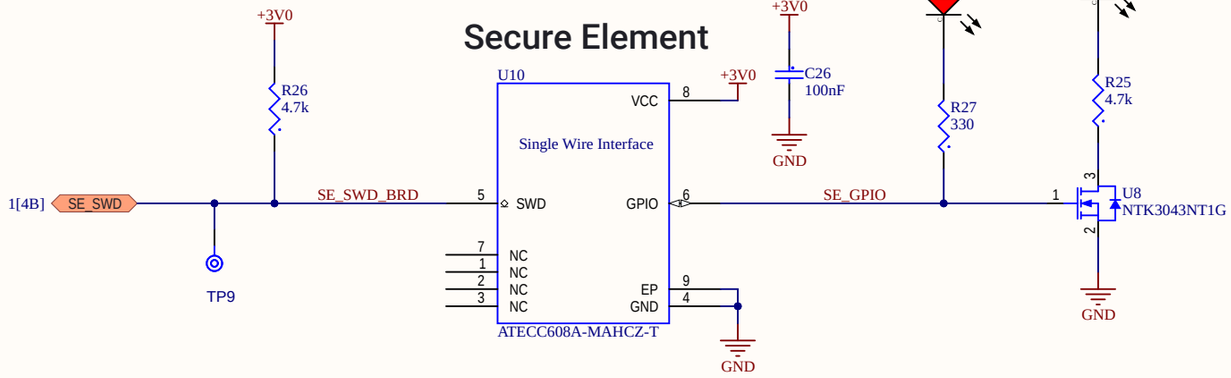
Design Note:
Signal Vih: 2.7V < Vih < 3.3V.
Applies to SCLK, SI, SCS, DISP, EXTCOMIN

Design Note:
Supply EXTCOMIN with a 1HZ pulse to maintain current display.

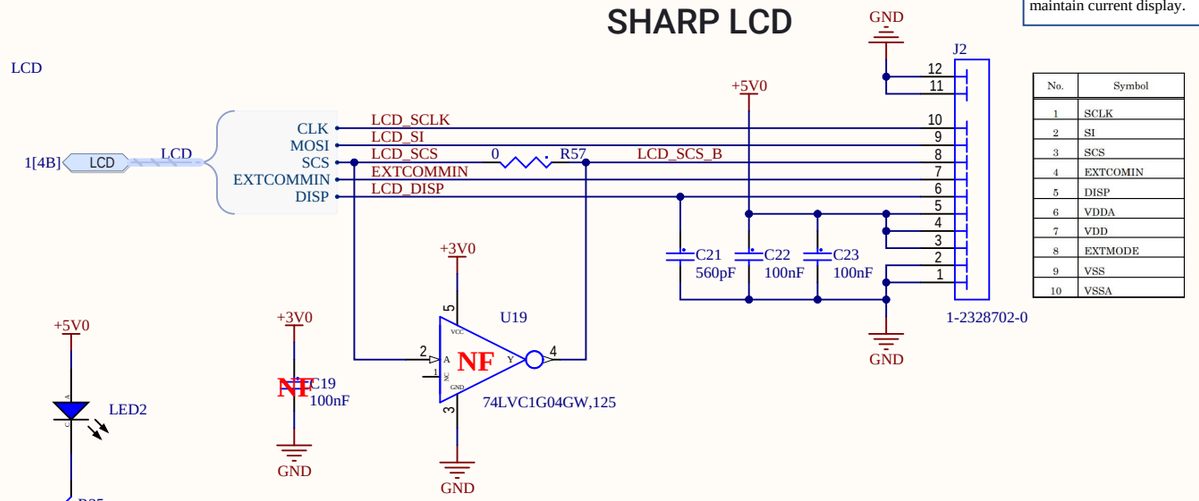
Ambient Light Sensor



Secure Element

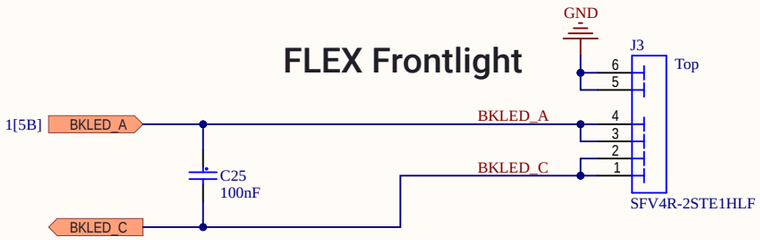


SHARP LCD

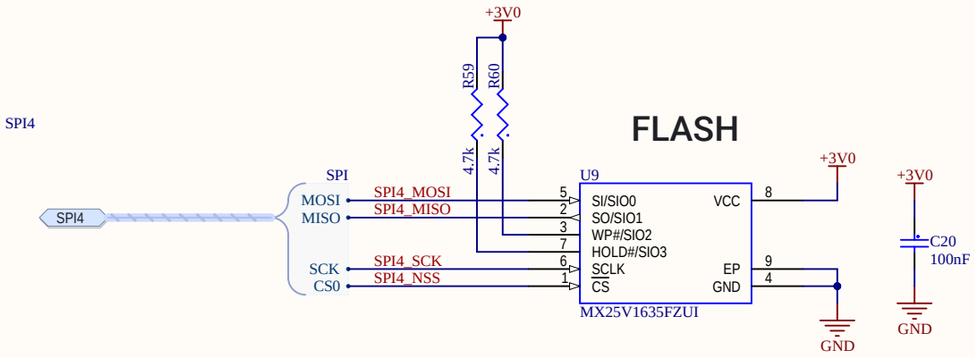


No.	Symbol
1	SCLK
2	SI
3	SCS
4	EXTCOMIN
5	DISP
6	VDDA
7	VDD
8	EXTMODE
9	VSS
10	VSSA

FLEX Frontlight



FLASH



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Power Regulators

Reverse Current Protection

Load Switch

Boost-Buck Regulator: 3V0 (1A max)

Current Monitor

Boost Regulator: 5V0 (150mA max)

Constant Current Boost Regulator @ 20mA

Design Note:
R1 = R2*(Vout/Vfb - 1)
R1 = 200k*(3V/0.5V - 1) = 1.0M

Design Note:
Vout = Rsense * (R39 / R36) * Isense
Vout = 0.05Ohm * (100k/1k) * Isense
Vout = 5Ohm * Isense

Design Note:
R1 = R2*(Vout/Vfb - 1)
R1 = 200k*(5V/0.5V - 1) = 1.8M

Design Note:
Rfb = Vfb / Ifb
Rfb = 120mV / 20mA = 6Ohms

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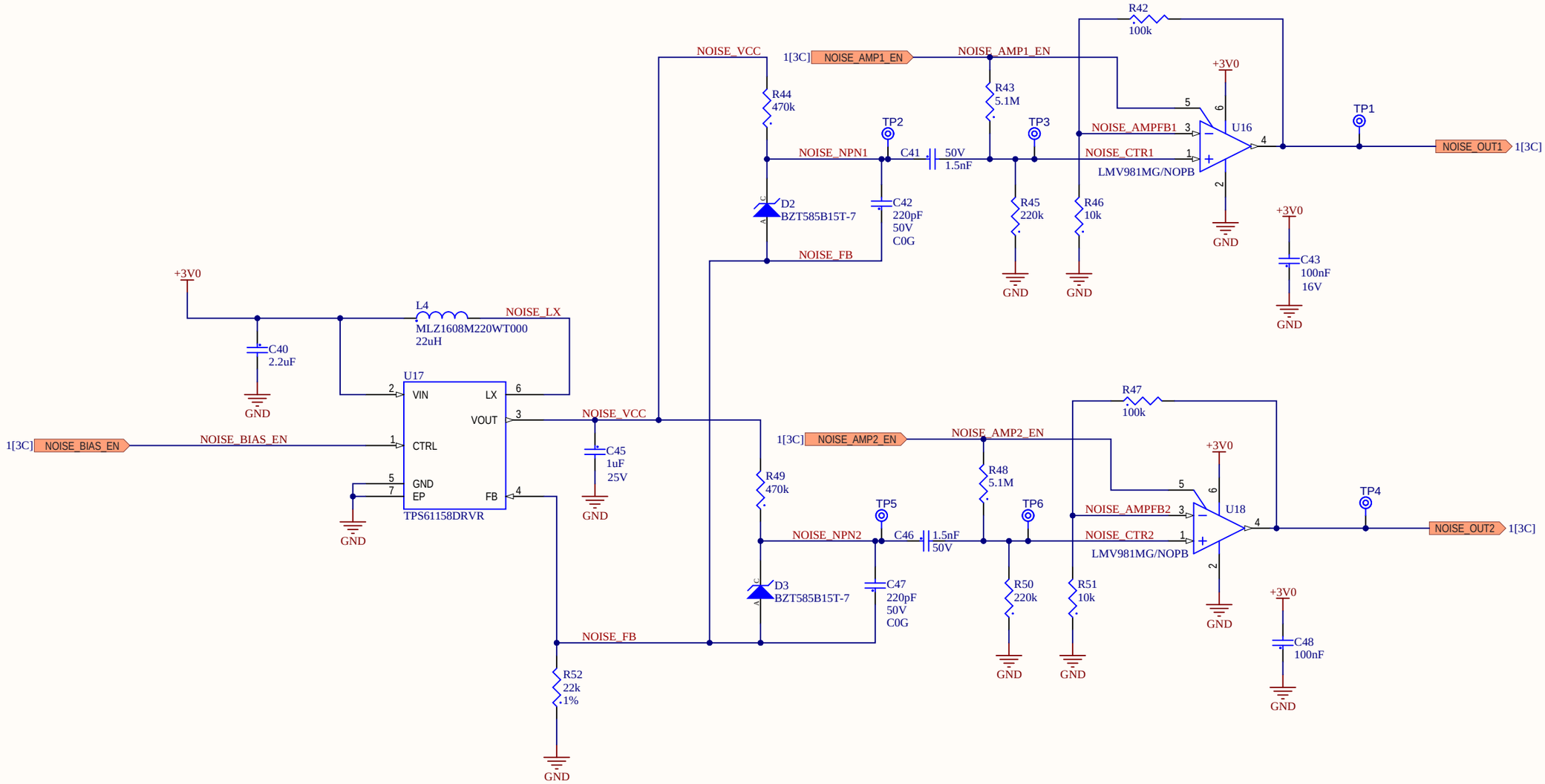
Avalanche Breakdown Noise Source



Circuit designed by:
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FOUNDATION

Drawing Title: FD-JUL-MB.PrjPcb			
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